

**WHAT IS CLAIMED IS:**

1. A single end to differential signal converter, comprising  
an input for receiving at least one single-ended signal;  
5 an input for receiving at least one in-phase voltage signal;  
an output for emitting at least one differential signal;  
a low-frequency transmitter that mixes a direct current and low-  
frequency component of said single-ended signal with said in-phase voltage  
signal, thereby generating a low-frequency transmission signal; and  
10 a high-frequency transmitter that mixes a high-frequency component of  
said single-end signal with said low-frequency transmission signal, thereby  
generating a differential signal.
2. The single end to differential signal converter according to claim 1,  
15 wherein said high-frequency transmitter comprises at least one transformer; said  
high-frequency signal is input to a primary side of said transformer; and said  
low-frequency transmission signal is input to a midpoint input terminal on a  
secondary side of said transformer.
- 20 3. The single end to differential signal converter according to claim 1,  
wherein said high-frequency transmitter comprises at least one single-power  
source-type differential amplifier with an in-phase voltage terminal; and said  
low-frequency signal is input to said in-phase voltage input terminal.
- 25 4. An analog-digital conversion method, comprising  
mixing a direct current and a low-frequency component of at least one  
single-ended signal with at least one in-phase voltage signal to produce a low-  
frequency transmission signal;  
mixing a high-frequency component of said single-ended signal and said  
30 low-frequency transmission signal, thereby generating a differential signal; and  
converting said differential signal to a digital signal.

5. A measuring apparatus, comprising
  - a signal input that inputs at least one measurement signal;
  - an in-phase voltage signal generator that generates at least one in-phase voltage signal;
- 5 a low-frequency transmitter that mixes a direct current and low-frequency component of said measurement signal with said in-phase voltage signal, thereby generating a low-frequency transmission signal;
- 10 a differential signal generator that mixes a high-frequency component of said measurement signal and said low-frequency transmission signal, thereby generating a differential signal;
- 10 an analog to digital converter that converts said differential signal to a digital signal; and
- 10 a signal processor that processes said digital signal.